

REMARKS

Claims 1-19 are pending in the application. Claims 20-70 have been cancelled in response to a restriction requirement. Claims 1, 7, and 8 have been amended. Claims 6 and 13 have been cancelled. Reconsideration is respectfully requested in view of the foregoing amendments and the following remarks. Those amendments and remarks are believed to be fully responsive to the Office Action mailed June 26, 2007 and to render the elected claims at issue patentably distinct over the cited references and in condition for allowance. The foregoing amendments are taken in the interest of expediting prosecution, and there is no intention of surrendering any range of equivalents to which Applicant would otherwise be entitled in view of the prior art.

I. Claim Rejections Under 35 U.S.C. § 103(a)

In the Office Action, the Examiner rejected claims 1, 5 and 17-19 as being unpatentable over U.S. Patent No. 6,942,780 B2 issued to Basol et al. on September 13, 2005 (hereinafter “Basol”) in view of U.S. Patent No. 7,220,451 B2 issued to Aaltonen et al. on May 22, 2007 (hereinafter “Aaltonen”) or “Electrodeposition of Copper Thin Film on Ruthenium,” by Chyan et al., J. of Electrochemical Soc., Vol. 150, pp. C347-50 (2003) (hereinafter “Chyan”). It is believed that the Examiner meant additionally to reject claim 7 as being unpatentable in view of the above references, as a discussion of claim 7 is included in the Examiner’s explanation of his rejection. Applicants respectfully traverse the Examiner’s rejections.

Claim 1 has been amended to include the elements of claim 6, which was rejected on the ground of nonstatutory obviousness-type double patenting over claims 1-39 of U.S. Patent No. 7,105,082 to Hardikar. Accordingly, a terminal disclaimer has been filed herewith to overcome the rejection. As there are no other grounds for rejection of original claim 6, now amended claim 1, in the Office Action, it is believed that claim 1, and hence claims 2-5, 7-12, and 14-19 are in condition for allowance.

Nevertheless, for the sake of clarification, Application notes that amended claim 1 is directed to a method for electrodeposition of copper on a noble metal layer of a work piece, wherein the method comprises selecting an electrodeposition temperature and exposing the noble metal layer to an electrodeposition composition. The

electrodeposition composition comprises a copper salt, a suppressor, an accelerator and an electrolyte. The suppressor has a cloud point that is no less than the electrodeposition temperature. The electrodeposition composition further comprises an anion in an amount sufficient to lower the cloud point to a temperature approximately no greater than the electrodeposition temperature if the cloud point is greater than the electrodeposition temperature. Electrodeposition of copper on a surface of the noble metal layer is initiated by application of a predetermined current density to the work piece. The initiating of the electrodeposition is terminated upon the occurrence of a predetermined event.

For a claim to be properly rejected for obviousness, the Examiner must show that the subject matter sought to be patented would have been obvious to one of ordinary skill in the art at the time the invention was made. Applicant respectfully submits that a *prima facie* case of obviousness has not been made out by the Examiner with respect to amended claim 1, and hence claims 5, 7, and 17-19 that depend therefrom, because every critical element appearing in the claims is not disclosed by Basol, Aaltonen, or Chyan, either alone or in combination. For example, none of the references teach, suggest or disclose a method for electrodeposition of copper on a noble metal layer of a work piece wherein the noble metal layer is exposed to an electrodeposition composition that has a suppressor with a cloud point that is no less than a selected electrodeposition temperature. In addition, the references do not teach, suggest, or disclose using an electrodeposition composition further comprising an anion in an amount sufficient to lower the cloud point to a temperature approximately no greater than the electrodeposition temperature if the cloud point is greater than the electrodeposition temperature. Thus, claims 1, 5, 7, and 17-19 are not rendered obvious by Basol, Aaltonen, and Chyan.

In the Office Action, the Examiner rejected claims 2-4 as being unpatentable over Basol in view of Aaltonen or Chyan and further in view of U.S. Patent No. 6,261,433 issued to Landau on July 17, 2001 (hereinafter "Landau"). Applicants respectfully traverse the Examiner's rejections.

Claims 2-4 depend from amended claim 1. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been made out by the Examiner with respect to amended claim 1, and hence claims 2-4 that depend therefrom, because every critical element appearing in the claims is not disclosed by Basol, Aaltonen, Chyan,

or Landau, either alone or in combination. For example, none of the references teach, suggest or disclose a method for electrodeposition of copper on a noble metal layer of a work piece wherein the noble metal layer is exposed to an electrodeposition composition that has a suppressor with a cloud point that is no less than a selected electrodeposition temperature. In addition, the references do not teach, suggest, or disclose using an electrodeposition composition further comprising an anion in an amount sufficient to lower the cloud point to a temperature approximately no greater than the electrodeposition temperature if the cloud point is greater than the electrodeposition temperature. Thus, claims 2-4 are not rendered obvious by Basol, and Aaltonen or Chyan, in view of Landau.

The Examiner also rejected claims 9-16 as being unpatentable over Basol combined with Aaltonen or Chyan and further in view of 6,610,192 B1 issued to Step et al. on August 26, 2003 (hereinafter "Step"). Applicant respectfully traverses the Examiner's rejections.

Claims 9-16 depend from amended claim 1. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been made out by the Examiner with respect to amended claim 1, and hence claims 9-16 that depend therefrom, because every critical element appearing in the claims is not disclosed by Basol, Aaltonen, Chyan, or Step, either alone or in combination. For example, none of the references teach, suggest or disclose a method for electrodeposition of copper on a noble metal layer of a work piece wherein the noble metal layer is exposed to an electrodeposition composition that has a suppressor with a cloud point that is no less than a selected electrodeposition temperature. In addition, the references do not teach, suggest, or disclose using an electrodeposition composition further comprising an anion in an amount sufficient to lower the cloud point to a temperature approximately no greater than the electrodeposition temperature if the cloud point is greater than the electrodeposition temperature. Thus, claims 9-16 are not rendered obvious by Basol, and Aaltonen or Chyan, in view of Step.

II. Double Patenting Rejection

In the Office Action, the Examiner rejected claims 6-8 on the ground of nonstatutory obviousness-type double patenting over claims 1-39 of U.S. Patent No. 7,105,082 to Hardikar. Accordingly, a terminal disclaimer has been filed herewith to overcome the rejection. As there are no other grounds for rejection of original claim 6, now amended claim 1, in the Office Action, it is believed that claim 1, and hence claims 2-5, 7-12, and 14-19 are in condition for allowance.

III. Claim Rejection Under 35 U.S.C. Sec. 112

In the Office Action, the Examiner rejected claim 13 on the ground that it contains a trademark/trade name. Claim 13 has been cancelled and it is, thus, believed that the Examiner's rejection is now moot.

CONCLUSION

In conclusion, for the reasons given above, all claims now presently in the application are believed allowable and such allowance is respectfully requested. Should the Examiner have any questions or wish to further discuss this application, Applicant requests that the Examiner contact the undersigned attorney at (480) 385-5060.

If for some reason Applicant has not requested a sufficient extension and/or has not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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